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500.43444X00



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Masahiro SONE

Serial No.: 10/765,165

Filed: January 28, 2004

For: STORAGE CONTROL DEVICE AND CONTROL METHOD
THEREFOR

**PETITION TO MAKE SPECIAL
UNDER 37 CFR 1.102(d) and MPEP. §708.02, VIII**

MS Petition

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

February 23, 2005

Sir:

1. Petition

Applicants hereby petition to make this application **Special**, in accordance with 37 CFR §1.102(d) and MPEP 708.02, VIII. The present invention is a new application filed in the United States Patent and Trademark Office on January 28, 2004 and as such has not received any examination by the Examiner.

2. Claims

Applicants hereby represent that all the claims in the present application are directed to a single invention. If upon examination it is determined that all the claims presented are not directed to a single invention, Applicants will make an election without traverse as a prerequisite to the granting of special status.

02/25/2005 AWONDAF1 00000061 10765165

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3. Search

Applicants hereby submit that a pre-examination search has been made by a professional searcher.

The field of search covered:

| <u>Class</u> | <u>Subclasses</u> | <u>Description</u> |
|--------------|-------------------|--|
| 361/ | | ELECTRICITY: ELECTRICAL SYSTEMS AND DEVICES |
| | 65 | ..With current and voltage responsive fault sensors |
| | 87 | ..Current |
| | 115 | .With specific circuit breaker or control structure |
| 711/ | | ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS: MEMORY |
| | 114 |Arrayed (e.g., RAIDs) |
| 713/ | | ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS: SUPPORT |
| 300 | | COMPUTER POWER CONTROL |

The above subclasses represent areas deemed to contain subject matter of interest to one or more of the search features. Please note that relevant references may be classified outside of these areas. The integrity of the search is based on the records as presented to us by the United States Patent and Trademark Office (USPTO). No further integrity studies were performed. Also a key word search was performed on the USPTO full-text database including published U.S. patent applications.

4. Copy of References

A listing of all references found by the professional searcher is provided by a Form PTO-1449 and copies of the references and the Form PTO-1449 are submitted as part of an Information Disclosure Statement (IDS) filed on even date.

5. Detailed Discussion of the References and Distinctions Between the References and the Claims

Below is a discussion of the references uncovered by the search and cited in the IDS filed on even date that appear to be most closely related to the subject matter encompassed by the claims of the present application, and which discussion particularly points out how Applicants' claimed subject matter is distinguishable over those references. All other references uncovered by the search and cited in the IDS filed on even date are **not** treated in detail herein.

a. Detailed Discussion of the References

Wiscombe (U.S. Patent No. 4,618,779) provides for a system for parallel power supplies. As per Fig. 6, disclosed are power supplies 1-N connected in parallel at a load 12. A controller 60 determines unacceptable imbalanced current conditions and then corrects the imbalanced conditions (see figure 6; column 6, lines 47-68; and column 7, lines 1-13).

Cargemel et al. (U.S. Patent No. 6,295,609 B1) discloses a multidisk storage system in Fig. 1 thereof equipped with at least two disk units (UND1-UND3), a power distribution point (P) and a control unit (circuit breakers) (EG1-EG5). The circuit breakers EG1-EG5 detect a fault current (having an intensity in current higher than a normal operating condition). The control units EG1-EG5 automatically control the opening and the closing of the lines LI1-LI5 (see figure1; column 4, lines 1-7, 21-29; column 5, lines 20-44; and column 7, lines 33-51).

Olson (U.S. Patent No. 6,385,024 B1) disclose in Figs. 1 and 4 multiple parallel power supplies 100a-100c connected to current load sharing circuits 101a-

101c. The load sharing circuits 101a-101c measure a current output of the power supplies 100a-100c in order to provide equal load sharing. A current break signal is used to trigger a circuit breaker 342 if a total current exceeds a predetermined limit (see figures 1, 4-5; column 3, lines 4-7; and column 5, lines 1-19).

Sueoka et al. (U.S. Patent Application Publication No. 2001/0047448 A1) provides for an address layout managing method and an external storage subsystem therewith. As per Figs. 1-6, disclosed is a control of an external storage subsystem having a first I/O control unit formed by a first channel adapter 45a and a second I/O control unit formed by a second channel adapter 45b. The control has a plurality of d.c. power supply units 323-6 and breaker boxes 321-1 and 321-2 (see figures 1, 4, 6-7; and paragraphs 54-55).

Sakai et al. (U.S. Patent Application Publication No. 2002/0031000 A1), provides for an uninterruptible duplexed power supply system, and unit plug-in structure for uninterruptible duplexed power supply system. As per Figs. 1-5, disclosed is an uninterruptible duplexed power supply for hard disk or other electronic circuits 7. A current balancing circuit 36 is used for balancing an input current value of a primary circuit B of a second unit 6 at a predetermined balancing ratio. CBL is a current balancing terminal for connecting the current balancing circuit 36 of a first unit 4 to a current balancing circuit 36 of the second unit 6 (see figures 2, 4; and paragraphs 18 and 39).

b. Distinctions Between the References and the Claims

The present invention as recited in the claims is not taught or suggested by any of the above noted references whether taken individually or in combination with

each other or in combination with any of the other references now of record.

The present invention as recited in the claims is directed to a storage control device including a first I/O control unit which includes a channel control unit connected with an information processing device to communicate data and receive a data I/O request from the information processing device, a disk control unit connected with at least one hard disk drive storing data and reading and writing data to the hard disk drive according to the data I/O request, a cache memory for storing data between the channel control unit and the disk control unit, and a connection unit interconnecting the channel control unit, the disk control and the cache memory.

The storage control device of the present invention as recited in the claims further includes a second I/O control unit whose current consumption is approximately equal to that of the first I/O control unit, at least two first power supply devices supplying electric power to the first I/O control unit, at least two second power supply devices supplying electric power to the second I/O control unit, and at least three circuit breakers receiving electric power supplied from outside and supplying the electric power to the first and second power supply devices while interrupting the supply of the electric power when current exceeds a preset level.

According to the present invention as recited in the claims, each of the first and second power supply devices includes a current balancing circuit for equalizing output currents of the first and second power supply devices. Alternatively, the current balancing circuit can be provided in each of the circuit breakers. Thus, the present invention is intended to balance current among plural power supply devices.

The above described features of the present invention are not taught or suggested by any of the above described references or any of the other references

of record whether taken individually or in combination with each other.

For example, the above described features of the present invention are not taught or suggested by Wiscombe. As per the above, Wiscombe merely shows a plurality of power supplies connected in parallel relative to a load. Wiscombe teaches that a controller is provided for determining unacceptable imbalanced current conditions in the power supplies and corrects such imbalanced conditions by selectively changing the value of the appropriate variable resistive element in the sense line of that power supply in order to change the current being delivered to the load.

The present invention as recited in the claims differs from that taught by Wiscombe being that the present invention is implemented in a storage control device wherein the storage control device is segmented into first and second I/O control units and two or more power supply devices are provided so as to correspond to each of the I/O control units. As recited in the claims, at least three circuit breakers are provided for receiving electric power from outside of the storage control unit and for supplying the electric power to the first and second power supply devices, wherein the at least three circuit breakers interrupt the supply of electric power when the current exceeds a preset level. Further, as recited in the claims, each of the first and second power supply devices includes a current balancing circuit for equalizing the output currents of the first and second power supply devices. Still further, as recited in the claims, the current balancing circuit alternatively can be provided in each of the circuit breakers. These features of the present invention as recited in the claims are not taught or suggested by Wiscombe.

The above noted deficiencies of Wiscombe are also evident in each of the

above described references, namely Cargemel, Olson, Sueoka and Sakai, and each of the other references of record. Therefore, the above described references and the other references of record whether taken individually or in combination with each other do not teach or suggest the features of the present invention as recited in the claims.

For example, Cargemel simply discloses a power distribution point and a control unit. However, there is no teaching or suggestion in Cargemel of a current balancing circuit for equalizing output currents of the power supply devices of a storage control device as in the present invention. Olson, Sueoka and Sakai each suffer from the same deficiencies as Wiscombe and Cargemel. Thus, combining the teachings of Wiscombe with one or more of Cargemel, Olson, Sueoka and Sakai and any of the other references of record do not teach or suggest the features of the present invention as recited in the claims.

Based on the above, Applicants submit that the claims of the present application are patentable over the above described references and the other references of record whether taken individually or in combination with each other.

6. Fee (37 C.F.R. 1.17(i))

The fee required by 37 C.F.R. § 1.17(i) is to be paid by:

☒ the Credit Card Payment Form (attached) for \$130.00.

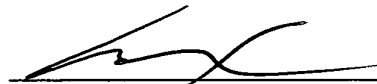
☐ charging Account _____ the sum of \$130.00.

A duplicate of this petition is attached.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (500.43444X00).

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.



Carl I. Brundidge
Registration No. 29,621

CIB/jdc
Enclosures
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**CHANGE OF
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Application

Address to:
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P.O. Box 1450
Alexandria, VA 22313-1450



| | |
|------------------------|------------------|
| Application Number | 10/765,165 |
| Filing Date | January 28, 2004 |
| First Named Inventor | M. SONE |
| Art Unit | |
| Examiner Name | |
| Attorney Docket Number | 500.43444X00 |

Please change the Correspondence Address for the above-identified patent application to:

☒ The address associated with
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OR

☒ Firm or
Individual Name **MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.**

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I am the:

☐ Applicant/Inventor

☐ Assignee of record of the entire interest.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☒ Attorney or agent of record. Registration Number **29,621**.

☐ Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration.
See 37 CFR 1.33(a)(1). Registration Number _____

Signature

Typed or Printed

Name

Carl I. Brundidge

Date

February 23, 2005

Telephone

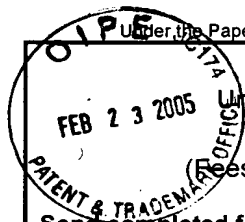
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NOTE: Signatures of all the inventors or assignee of record of the entire interest of their representative(s) are required. Submit multiple forms if more than one signature is required, see below".

☐ *Total of _____ form are submitted.

This collection of information is required by 37 CFR 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**PETITION FEE**

Under 37 CFR 1.17(f), (g) & (h)

TRANSMITTAL

(Fees are subject to annual revision)

Send completed form to: Commissioner for Patents
P.O. Box 1450, Alexandria, VA 22313-1450

| | |
|------------------------|------------------|
| Application Number | 10/765,165 |
| Filing Date | January 28, 2004 |
| First Named Inventor | Masahiro SONE |
| Art Unit | |
| Examiner Name | |
| Attorney Docket Number | 500.43444X00 |

Enclosed is a petition filed under 37 CFR §1.102(d) that requires a processing fee (37 CFR 1.17(f), (g), or (h)). Payment of \$ 130.00 is enclosed.

This form should be included with the above-mentioned petition and faxed or mailed to the Office using the appropriate Mail Stop (e.g., Mail Stop Petition), if applicable. For transmittal of processing fees under 37 CFR 1.17(i), see form PTO/SB/17i.

Payment of Fees (small entity amounts are NOT available for the petition (fees))

- ☒ The Commissioner is hereby authorized to charge the following fees to Deposit Account No. 50-1417:
- ☐ petition fee under 37 CFR 1.17(f), (g) or (h) ☒ any deficiency of fees and credit of any overpayments
- Enclose a duplicative copy of this form for fee processing.
- ☐ Check in the amount of \$ _____ is enclosed.
- ☒ Payment by credit card (From PTO-2038 or equivalent enclosed). Do not provide credit card information on this form.

| | | |
|---|------------------|----------------------|
| Petition Fees under 37 CFR 1.17(f): For petitions filed under: § 1.53(e) - to accord a filing date. § 1.57(a) - to according a filing date. § 1.182 - for decision on a question not specifically provided for. § 1.183 - to suspend the rules. § 1.378(e) for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in an expired patent. § 1.741(b) - to accord a filing date to an application under §1.740 for extension of a patent term. | Fee \$400 | Fee Code 1462 |
| Petition Fees under 37 CFR 1.17(g): For petitions filed under: §1.12 - for access to an assignment record. §1.14 - for access to an application. §1.47 - for filing by other than all the inventors or a person not the inventor. §1.59 - for expungement of information. §1.103(a) - to suspend action in an application. §1.136(b) - for review of a request for extension of time when the provisions of section 1.136(a) are not available. §1.295 - for review of refusal to publish a statutory invention registration. §1.296 - to withdraw a request for publication of a statutory invention registration filed on or after the date the notice of intent to publish issued. §1.377 - for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of a patent. §1.550(c) - for patent owner requests for extension of time in <u>ex parte</u> reexamination proceedings. §1.956 - for patent owner requests for extension of time in <u>inter partes</u> reexamination proceedings. § 5.12 - for expedited handling of a foreign filing license. § 5.15 - for changing the scope of a license. § 5.25 - for retroactive license. | Fee \$200 | Fee code 1463 |
| Petition Fees under 37 CFR 1.17(h): For petitions filed under: §1.19(g) - to request documents in a form other than that provided in this part. §1.84 - for accepting color drawings or photographs. §1.91 - for entry of a model or exhibit. §1.102(d) - to make an application special. §1.138(c) - to expressly abandon an application to avoid publication. §1.313 - to withdraw an application from issue. §1.314 - to defer issuance of a patent. | Fee \$130 | Fee Code 1464 |

| | | | |
|-------------------|-------------------|-----------------------------------|-------------------|
| Name (Print/Type) | Carl I. Brundidge | Registration No. (Attorney/Agent) | 29,621 |
| Signature | | Date | February 23, 2005 |

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.